

ABSTRACT OF THE DISCLOSURE

Disclosed are a non-volatile memory device to protect a floating gate from charge loss and a method for forming the same. At least a pair of floating gate lines are formed on a semiconductor substrate. A portion of the substrate between the floating gate lines is etched to form a trench therein. A gap-fill dielectric layer is formed in the trench and also in the gap
5 between the pair of floating gate lines. The gap-fill dielectric layer is implanted with impurities so that positive mobile ions that may permeate the floating gate through the gap-fill dielectric layer can be trapped in the gap-fill dielectric layer.